Experimental demonstration of photonic crystal 4-channel drop filter

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We report an experimental demonstration of a photonic crystal-based in-plane 4-channel drop filter. By modifying our previous two-dimensional photonic crystal system operating in the microwave region [1], we constructed highly selective and efficient drop filters based on resonant tunneling. By placing designed cavity defects near a bus waveguide, we obtained cavity Q-factor as large as ~500 and higher than 20 dB drop selectivity between ports, all at controlled frequencies. These results are agreed well with FDTD calculation results. In addition, performance improvement due to the reflection feedback from terminated bus waveguide was considered [2].

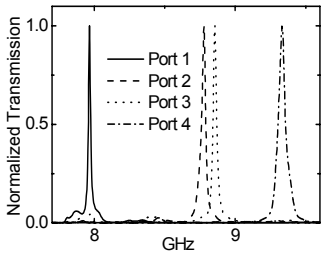

Fig. 0 Transmission spectra for 4 drop channels

[1] Y.-G. Roh, *et al*., *Appl. Phys. Lett.,* **83,** 231 (2003).
[2] S. Kim, *et al*., *Opt. Express,* **12**, 5518 (2004).